Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Union Carbide Corporation St Charles Operations
Union Carbide Corp - St Charles Operations
Taft St. Charles Parish, Louisiana
Agency Interest Number: 2083
Activity Number: PER20090006
Proposed Permit Number: 476-V2

Company:
Union Carbide Corp - St Charles Operations
PO Box 50
Hahnville, Louisiana 70057-0050

Facility:
Union Carbide Corp
355 Hwy 3142
TaftSt, Charles Parish, Louisiana
Approximate UTM coordinates are 746.184 km East and 3,319.222 km North, Zone 15.

I. FACILITY AND CURRENT PERMIT STATUS

Union Carbide Corporation, a subsidiary of the Dow Chemical Company, owns and operates a chemical manufacturing facility in St. Charles Parish near Taft. St. Charles Operations (SCO) is an integrated petrochemical manufacturing complex, converting petroleum-based raw materials into a variety of basic building block, intermediate chemicals and plastics. The products from this facility eventually wind-up in thousands of everyday household, business, and consumer products. The facility as a whole started operation before 1969.

Ethylene oxide (EO) is produced in the Oxide I Plant at Union Carbide Corporation, St. Charles Operations (SCO) by reacting ethylene and oxygen in the presence of a catalyst. Methane is used as a ballast gas. Since the reaction is exothermic, there is a teralin heat transfer system that is used to recover the heat and generate steam.

Carbon dioxide, a byproduct of the reaction, is removed from the process by absorption in a potassium carbonate solution. The carbon dioxide is stripped from the solution and vented to the atmosphere through a catalytic oxidation unit, which burns the trace hydrocarbons. Impurities that enter the process with the ethylene, oxygen, and methane are purged from the system to either a flare for destruction or the site fuel gas system. The EO is scrubbed from the system using water.

The EO is then stripped from the water and sent on to a series of distillation columns where the EO is concentrated and purified. The purified EO is sent to storage tanks in Site Logistics to either be shipped offsite in railcars as a product or used by other plants within SCO. The remainder of the EO is reacted with water to produce ethylene glycol. The excess water from the glycol system is recovered via a series of evaporators and returned to the process. The monoethylene glycol is separated from the heavier glycols in a distillation column.

Union Carbide Corp - St Charles Operations is a designated Part 70 source. Several Part 70 permits have been issued to the operating plants within the complex. These include:

Permit No.	Plant or Source	Date Issued
2422-V1	Olefins I & II	9/30/2004 *
2656-V0	Olefins Distribution/Site Logistics Units	3/13/2006 *(Amended 3/28/2007)*
2214-V0	LP-6	3/27/2006
2254-V0	Acrylics 2	6/19/2006 *(Amended 7/20/2007)*
2876-V1	Unit 9	8/10/2006 *
513-V2	Acrylics I	6/15/2007
1909-V1	Higher Glycols Plant	6/18/2007
2446-V1	Unit 8 (EXP)	7/3/2007
2257-V4	TB1 and TB2 Units	10/9/2007
2343-V1	Energy Systems	1/31/2008
2814-V1	MGE Plant	2/28/2008
2858-V0	PXC Unit	*(Rescinded 4/8/2008)*
373-V2	Oxide II	6/13/2008
477-V0	Unit 5 (Amines I)	*(Rescinded 7/12/2008)*
1912-V1	SPU	6/25/2009
2350-V4	LP-3 Unit	7/20/2009
2104-V2	Environmental Operations Plant	9/25/2009
2421-V1	Amines Plants	10/15/2009

* Timely renewal submitted.

II. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application and Emission Inventory Questionnaire dated September 3, 2009, were received by LDEQ on September 8, 2009 requesting a Part 70 operating permit

renewal and modification. Additional information dated November 12, December 1, 2, and 4, 2009, was received as well.

Project

UCC is requesting to implement the SCO EO Refining Expansion Project that will install new equipment to increase EO refining capacity at SCO (purify more EO product). This project will also affect sources in the Oxide II Plant (Permit No. 373-V2) and Site Logistics (Permit No. 2656-V0).

Besides purifying more EO at the Oxide I Plant, this modification will permanently shut down the glycol system as well. The project will modify and expand existing distillation processes for EO refining. This will generate a new water stream that will be further processed in the glycol recovery system that consists of a glycol reactor and stream stripper. The vent stream from the stripper will be routed to a flare in the Oxide II Plant (EPN 60F / EQT0312) or Oxide I Plant (EPN 46M / EQT117). The project will also add a cooling water tower.

The following emission point sources related solely to the glycol system in the Oxide I Plant will be deleted:

- Final Concentrator Vacuum Jet Vent (RL-201) (EPN 36 / EQT112)
- Ethylene Glycol Refining Column Vacuum Jet Vent (RL-205) (EPN 37 / EQT113)
- Evaporator 5 psig Steam Vent 9 PICA-250-90) (EPN 46X / EQT121)
- Condensate Tank Vent to Atmosphere (5 psig) (EPN 2202 / EQT124)

The storage tanks for the purified EO product and railcar loading, vent to the Ethylene Oxide Flare (EPN 507 / EQT146) in Site Logistics, or to the Oxide II Plant for recovery. In addition to tank and loading throughput changes, UCC is proposing to vent the storage tanks and the railcar loading to the Ethylene Oxide Flare at all times.

Proposed Permit

Permit 476-V2 will be the renewal / modification Part 70 operating permit for the Oxide I Plant.

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Permitted Air Emissions

Estimated emissions in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	0.12	1.27	+1.15
SO_2	0.06	0.05	-0.01
NO_X	4.03	5.82	+1.79
CO	22.17	31.66	+9.49
VOC *	30.52	36.62	+6.10
Hydrochloric Acid	-	0.02	+0.02

* Includes 3.53 TPY of Toxic Air Pollutants (TAPs).

IV REGULATORY ANALYSIS

The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are also provided in the Specific Requirements section of the proposed permit.

Applicability and Exemptions of Selected Subject Items

For the applicability and exemptions of selected subject items at the unit, refer to Section X - Table 1. Applicable Louisiana and Federal Air Quality Requirements, and Section XI -Table 2. Explanation for Exemption Status or Non-Applicability of a Source, of the proposed permit.

Prevention of Significant Deterioration/Nonattainment Review

None

Streamlined Equipment Leak Monitoring Program

It is required that the Oxide I Plant comply with a streamlined equipment leak monitoring program. Compliance with the streamlined program shall serve to comply with each of the fugitive emission monitoring programs being streamlined.

For the Oxide I Plant, fugitive emissions are subject to the requirements of 40 CFR 63 Subpart H, 40 CFR 60 Subpart VVa, LAC 33:III.5109, Louisiana Non-HON MACT, and LAC 33:2121. Among these regulations, 40 CFR 63 Subpart H is the overall most stringent program. Therefore, fugitive emissions shall be monitored as required by this program (40 CFR 63 Subpart H).

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Unit or Plant Site	Program Being Streamlined	Stream Applicability	Overall Most Stringent Program
Oxide I Plant	40 CFR 63 Subpart H – HON	≥ 5% VOHAP	40 CFR 63 Subpart H – HON
	40 CFR 60 Subparts VV and VVa – NSPS for Equipment Leaks of VOC in SOCMI or Refineries	≥ 10% VOC	
	LAC 33:III.2121 – Fugitive Emission Control	≥ 10% VOC	
	LAC 33:III.5109 – Louisiana MACT Determination for Non-HON Sources	≥ 5% VOTAP	

MACT Requirements

Oxide I Plant does need to comply with State MACT standards. Class I and II pollutants, regulated under LAC 33:III Chapter 51, are emitted.

UCC meets MACT requirement by complying with NESHAP (HON) Subparts F and G where applicable. When the HON is not applicable, the facility complies with Louisiana MACT.

Air Quality Analysis

none

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to the Section VIII – General Condition XVII Activities of the proposed permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of the proposed permit.

V. PERMIT SHIELD

None

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VI. PERIODIC MONITORING

This plant is included in the Louisiana Fugitive Emissions Program Consolidation. Union Carbide conducts fugitive emissions monitoring in accordance with the specific conditions of this program (see Specific Requirement Section of draft permit). Compliance with these specific conditions shall serve to comply with each of the several programs being streamlined. The overall most stringent program for Oxide I Plant is 40 CFR 63 Subpart H (HON).

VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H_2S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_X) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$ 10 tons per year of any toxic air pollutant; $\geq$ 25 tons of total toxic air pollutants; and $\geq$ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10} – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO_2) – An oxide of sulfur.

Sulfuric Acid (H_2SO_4) – A highly corrosive, dense oily liquid. It is a regulated toxic air pollutant under LAC 33:III.Chapter 51.

Title V Permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) – Any organic compound, which participates in atmospheric photochemical reactions; that is, any organic compound other than those, which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.